OFFICE OF SCIENCE AND TECHNOLOGY POLICY

ACTION: Notice of Request for Information (RFI).

SUMMARY: The purpose of this Request for Information (RFI) is to solicit input from all interested parties regarding recommendations for the development of a National Plan for Civil Earth Observations ("National Plan"). The public input provided in response to this Notice will inform the Office of Science and Technology Policy (OSTP) as it works with Federal agencies and other stakeholders to develop this Plan.

DATES: Responses must be received by December 6, 2013 to be considered.

SUBMISSION: You may submit comments by any of the following methods.

- Downloadable form: To aid in information collection and analysis, OSTP encourages responses to be provided using this form. Please enter your responses in the fillable fields that follow the questions below.
- Email: OSTP encourages respondents to email the completed form, as an attachment, to earthobsplan@ostp.gov. Please include "National Plan for Civil Earth Observations" in the subject line of the message.
- Fax: (202) 456-6071.
- Mail: Office of Science and Technology Policy, 1650 Pennsylvania Avenue, NW, Washington, DC, 20504. Information submitted by postal mail should allow ample time for processing by security.

Response to this RFI is voluntary. Respondents need not reply to all questions listed. Each individual or institution is requested to only submit one response. Responses to this RFI, including the names of the authors and their institutional affiliations, if provided, may be posted on line. OSTP therefore requests that no business proprietary information, copyrighted information, or personally-identifiable information be submitted in response to this RFI. Given the public and governmental nature of the National Plan, OSTP deems it unnecessary to receive or to use business proprietary information in its development. Please note that the U.S. Government will not pay for response preparation, or for the use of any information contained in the response.

FOR FURTHER INFORMATION CONTACT:

Timothy Stryker, 202-419-3471, tstryker@ostp.eop.gov, OSTP.

SUPPLEMENTARY INFORMATION:

Background

The U.S. Government is the world's largest single provider of civil environmental and Earth-system data. These data are derived from Earth observations collected by numerous Federal agencies and partners in support of their missions and are critical to the protection of human life and property; economic growth; national and homeland security; and scientific research. Because they are provided through public funding, these data are made freely accessible to the greatest extent possible to all users to advance human knowledge, to enable industry to provide value-added services, and for general public use.

Federal investments in Earth observation activities ensure that decision makers, businesses, first responders, farmers, and a wide array of other stakeholders have the information they need about climate and weather; natural hazards; land-use change; ecosystem health; water; natural resources; and other characteristics of the Earth system. Taken together, Earth observations provide the indispensable foundation for meeting the Federal Government's long-term sustainability objectives and advancing the Nation's societal, environmental, and economic well-being.

As the Nation's capacity to observe Earth systems has grown, however, so has the complexity of sustaining and coordinating civil Earth observation research, operations, and related activities. In October 2010, Congress charged the Director of OSTP to address this challenge by producing and routinely updating a strategic plan for civil Earth observations (see *National Aeronautics and Space Administration Authorization Act of 2010, Public Law 111-267, Section 702*).

Responding to Congress, in April 2013, OSTP released a National Strategy for Civil Earth Observations ("the National Strategy").

In April 2013, OSTP also re-chartered the U.S. Group on Earth Observations (USGEO) Subcommittee of the National Science and Technology Council's Committee on Environment, Natural Resources, and Sustainability. USGEO will carry out the National Strategy and support the formulation of the National Plan.

As requested by Congress, the National Plan is being developed by USGEO to advise Federal agencies on the Strategy's implementation through their investments in and operation of civil Earth observation systems. The Plan will provide a routine process, on a three-year cycle, for assessing the Nation's Earth observation investments; improving data management activities; and enhancing related interagency and international coordination. Through this approach, the Plan will seek to facilitate stable, continuous, and coordinated Earth observation capabilities for the benefit of society.

Congress also requested that development of the National Plan include a process for collecting external independent advisory input. OSTP is seeking such public advisory input through this RFI. The public input provided in response to this Notice will inform OSTP and USGEO as they work with Federal agencies and other stakeholders to develop the Plan.

Definitions and Descriptions

The term "**Earth observation**" refers to data and information products from Earth-observing systems and surveys.

"**Observing systems**" refers to one or more sensing elements that directly or indirectly collect observations of the Earth, measure environmental parameters, or survey biological or other Earth resources (land surface, biosphere, solid Earth, atmosphere, and oceans).

"**Sensing elements**" may be deployed as individual sensors or in constellations or networks, and may include instrumentation or human elements.

"**Observing system platforms**" may be mobile or fixed and are space-based, airborne, terrestrial, freshwater, or marine-based. Observing systems increasingly consist of integrated platforms that support remotely sensed, *in-situ*, and human observations.

Assessing the Benefits of U.S. Civil Earth Observation Systems

To assist decision-makers at all levels of society, the U.S. Government intends to routinely assess its wide range of civil Earth observation systems according to the ability of those systems to provide relevant data and information about the following Societal Benefit Areas (SBAs):

1. Agriculture and Forestry
2. Biodiversity
3. Climate
4. Disasters
5. Ecosystems (Terrestrial and Freshwater)
6. Energy and Mineral Resources
7. Human Health
8. Ocean and Coastal Resources and Ecosystems
9. Space Weather
10. Transportation
11. Water Resources
12. Weather

The U.S. Government also intends to consider how current and future reference measurements (*e.g.*, bathymetry, geodesy, geolocation, topography) can enable improved observations and information delivery.

To address measurement needs in the SBAs, the U.S. Government operates a wide range of atmospheric, oceanic, and terrestrial observing systems. These systems are designed to provide: (a) sustained observations supporting the delivery of services, (b) sustained observations for research, or (c) experimental observations to address specific scientific questions, further technological innovation, or improve services.

Questions to Inform Development of the National Plan

Name (optional): *Jon Kirchner*

Position (optional): *President & Chief Operating Officer*

Institution (optional): *GeoOptics, Inc.* www.geooptics.com

Through this RFI, OSTP seeks responses to the following questions:

1. Are the 12 SBAs listed above sufficiently comprehensive?

This list is quite comprehensive, as is. However, in the absence of SBA being an agreed and "defined term" it seems that there are other potential SBAs that areas - not listed – that could be potential SBAs. These potential areas that could be considered are:

- ***Infrastructure & Technology - Examples of this are dams, ports and marinas, water treatment, airports, roads, telecommunications, Internet and IT infrastructure – all of which are at risk to environmental and climate impacts, and day-to-day weather extremes. Climate adaptation, for example, bears quite directly on this critical societal and economic benefit area.***
- ***Public Safety & Homeland Security – In terms of first responders and the resources and infrastructure needed to respond to catastrophic environmentally-generated events (e.g. hurricanes, tornados, snow storms, wild fires, heat waves).***
- ***Finance & Real Property – The vast pool of sources of financing and environmental risk-management (banks, insurance companies, derivatives and other risk-mitigating finance organizations and real estate)***
- ***Defense – Despite the fact that SBAs are focused on the Civilian sector, there are cross-over elements of the Defense arena into Civilian that might also be considered. In contrast to Civilian public safety Defense reaches beyond the shores of our country where global Earth Observation (EO) and Remote Sensing (RS) infrastructure is also essential for preserving and monitoring shipping lanes, military assets overseas in addition to complementing Public Safety and Homeland Security.***

These are directly related to Earth Observation (EO)/Remote Sensing (RS) effort. It is also possible that attributes of any one of these could be found in the SBAs already existing. Reconciliation of this needs to be done – with a focus on economic and public safety results.

It is also essential that SBAs become defined terms beyond it's high-level description. It requires criterion, scope and structure. This will help greatly in the effort to focus and direct efforts in mapping our nation's global EO requirements, worldwide.

a. Should additional SBAs be considered?

Three resources in the URL links that OSTP might consider referring to and reconciling – as sources to both consider and define the right SBAs are the following:

http://www.dhs.gov/critical-infrastructure-sectors

http://www.dhs.gov/xlibrary/assets/NIPP_Plan.pdf

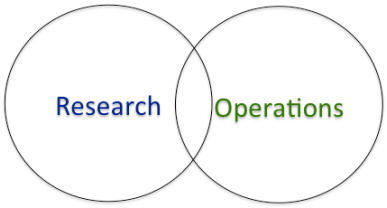
http://journals.ametsoc.org/doi/pdf/10.1175/2011BAMS2928.1

b. Should any SBA be eliminated?

See replies to 1.0 and 1.a above.

2. Are there alternative methods for categorizing Earth observations that would help the U.S. Government routinely evaluate the sufficiency of Earth observation systems?

At a high level there are two categories into which Earth observations fall: 1) scientific research and technology development and 2) operations, and the day-to-day operational application and use of Earth observations to solve societal and economical issues.



There are indeed areas of overlap and the lines are not absolute but perhaps best represented by the circles and their overlapping sections above.

In considering how essential it is for an agency, department or organization to be both economical and performance-effective we believe that the global EO/RS enterprise needs to take a "prioritized portfolio approach" to the role of assets in both Research and Operations (illustrated above). Specifically, we believe there are categorizations within Operations areas that shows where some Earth observation sensing elements and observing system platforms could be viewed in two sub-segments below labeled "Trial & Innovation" in contrast to "Proven & Commodity".

We believe that there are sensing element types that lend themselves to deep and wide standardization and thus low-cost production and service provision.

The former – Trial & Innovation – may continue to be sourced by Government ownership and agency/government capital expenditure (CapEx). We believe there is an ongoing need for owned, R&D assets.

Beyond this – in Proven & Commodity – there is a significant opportunity take highly scaled and commoditized data streams – whether temporal or spatial – and scale them at a very dense level. We believe that trusted and competent commercial service provides can well-address this portion of the prioritized portfolio.

3. What management, procurement, development, and operational approaches should the U.S. Government employ to adequately support sustained observations for services, sustained observations for research, and experimental observations? What is the best ratio of support among these three areas?

In "sustained observations" we believe the EO/RS community has an opportunity to look to private industry for the commercial, shared-user platform services provision of sensing elements, observing system platforms and the data-products that arise from these capabilities. Much like the US Government today uses telecommunications services provided by large US telecom operators, the US EO/RS enterprise could turn to the same cost-effective, privately run, shared-user platforms for Earth observation.

- ***The DoD looks to the commercial communications satellite industry to provide 80% of its bandwidth globally for the war-fighters' and commanders' secure, secret and critical communications,***
- ***NGA looks to commercial satellite imagery industry -- an industry that the US Government created -- for virtually all of it's non-TS intel imagery,***
- ***NASA has spurned and sponsored a vibrant commercial launch industry,***
- ***FAA uses privately funded commercial telecommunications services for its national airport infrastructure.***

At a time when…

- ***American-borne technology innovation, ingenuity and development continues to greatly surpass that of any other country in the world, and***
- ***Where the United States has such a clear global advantage and leadership position in earth observation, weather enterprise and climate expertise and science -- thanks to academia, the private sector and scientific research, and***
- ***There is at the same time unprecedented US budget pressure***

…it is time for the US Earth Observation & Remote Sensing community to proactively turn to the privately funded, service-producing commercial community for the acquisition, procurement and provision of reliable, standardized sensing elements and observing system platforms. The operational weather, space weather and climate communities would benefit greatly, as would our nation's economy and citizenry.

This does not mean the US Government should necessarily own all satellites or observing infrastructure. It means that the US Government can assertively turn to providers of privately funded, commercial managed-services companies who can lease these solution with proper services contracts and service-levels, under the Federal Acquisition Regulation (FAR).

4. How should the U.S. Government ensure the continuity of key Earth observations, and for which data streams (*e.g.*, weather forecasting, land surface change analysis, sea level monitoring, climate-change research)?

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5. Are there scientific and technological advances that the U.S. Government should consider integrating into its portfolio of systems that will make Earth observations more efficient, accurate, or economical? If so, please elaborate.

Miniaturization has been taking place "on the ground" in numerous technology areas for years, perhaps most profoundly in mobile technology. The move to "small, powerful, reliable AND cheap" is the leading force in technology today. This same trend is taking place in the space industry where "very small" is meeting "very powerful" -- and very reliable -- at costs dramatically cheaper than legacy aerospace and satellite systems. These capabilities are the ones the US Government should not only be looking at, but be incentivizing and rewarding commercial service companies to bring to the fore.

6. How can the U.S. Government improve the spatial and temporal resolution, sample density, and geographic coverage of its Earth observation networks with cost-effective, innovative new approaches?

Related to the response to 5 above, by turning to miniaturized observing system service platforms created and provided by commercial companies the government will dramatically reduce cost/observation and will thereby increase the opportunity for dramatically higher-density systems.

7. Are there management or organizational improvements that the U.S. Government should consider that will make Earth observation more efficient or economical?

Yes, there are. Today, the National Weather Service (NWS) does not acquire satellite-based observational data, itself. NWS hands over the specifications for the satellite data it needs/wants to a separate, internal NOAA organization, National Satellite, Environmental and Data Information Services (NESDIS), which builds, procures and owns satellite systems (through NASA) for its operational purpose. To near exclusion over decades, NESDIS does not seek to acquire the most cost effective data sources which could come from non-government commercial sources. This is done despite numerous statutory and policy references that enable them to purchase from a much wider set of sourcing options. Other reasons cited for this include a perception that the data is so critical to life and property that it can't be trusted with non-government hands. We would simply turn to the DoD's warfighter as a significant life-or-death example where the DoD acquires 80% of its bandwidth, globally, from commercial satellite communications companies for the most reliable, secret, secure and encrypted data and communications. Looking to commercial managed services for the best data will significantly widen the options to procure data, at lower costs and increased innovation:

- ***Existing statutory and policy compel NOAA to acquire, once we're in orbit***
  - ***Space Act of 1998 http://www.nasa.gov/offices/ogc/commercial/CommercialSpaceActof1998.html***
  - ***US Remote Sensing Policy http://www.fas.org/irp/offdocs/nspd/remsens.html***
- ***Procurement statutes exist for NOAA to make contract commitments today for data services it needs years ahead***
  - ***Anchor tenancy statutes http://www.space.commerce.gov/general/commercialpurchase/commitments.shtml#nasa***
  - ***Other Transaction Authority http://www.fas.org/sgp/crs/misc/RL34760.pdf***

In sum, the NESDIS practice and philosophy of "ownership" of sensing elements and observing system platforms is one that is not built on economics or managerial pragmatism, but on a culture of ownership and protective interest. In a day and time of budget constraints – accompanied by a more open "prioritized portfolio approach" to sourcing observations – there are great opportunities to both enhance NOAA's capabilities and the US Government's EO & RS capabilities at large. This can be achieved for greatly reduced costs and greater speed.

To be clear, we <u>do not</u> advocate shifting ALL or even a majority of observing capabilities to the private, commercial service realm. Much to the contrary. What we believe is that a material part of the total capabilities portfolio in Operations – the "proven & commodity" type -- can be shifted to low-cost, highly-standardized outsourced commercial services that will dramatically lower cost, much faster and with enhance capability.

8. Can advances in information and data management technologies enable coordinated observing and the integration of observations from multiple U.S. Government Earth observation platforms?

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9. What policies and procedures should the U.S. Government consider to ensure that its Earth observation data and information products are fully discoverable, accessible, and useable?

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10. Are there policies or technological advances that the U.S. Government should consider to enhance access to Earth observation data while also reducing management redundancies across Federal agencies?

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11. What types of public-private partnerships should the U.S. Government consider to address current gaps in Earth observation data coverage and enhance the full and open exchange of Earth observation data for national and global applications?

Partnering can come in a variety of forms. These forms are often dictated by the amount and degree to which an organization wants to control or to operate or to own or manage a particular capability all matched against the costs associated with that capability. The more "strategic" the capability is considered, the more direct control and direct ownership are often desired. The more "tactical" or

commodity-like is a needed capability, the less direct control or direct ownership is desired. Other times, cost and available cash is the biggest dictator of structure – especially when the project or need is in the $100Ms or $1Bs. Leasing a service (OpEx) versus owning (CapEx) can be the most efficient form of partnering.

Objectives dictate direction. We believe there is important and vital room to be made for engaging private commercial services providers to provide quick, inexpensive and reliable data solutions for a portion of the US Government's "prioritized portfolio" of observations. Today, such a balanced and pragmatic approach is essentially absent from the US Government's core EO & RS data-collection and sourcing mix and infrastructure.

We believe this needs to change and can be done so through commercial services and contracting approaches by government with private industry service providers – that will ultimately stimulate a new and more vibrant data-driven environmental data industry.

12. What types of interagency and international agreements can and should be pursued for these same purposes?

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